**UNIT -1**

**INTRODUCTION TO INVENTORY MANAGEMENT**

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**What is inventory? State the objective for maintaining inventory.**

Inventory is an accounting term that refers to goods that are in various stages of being made ready for sale, including:

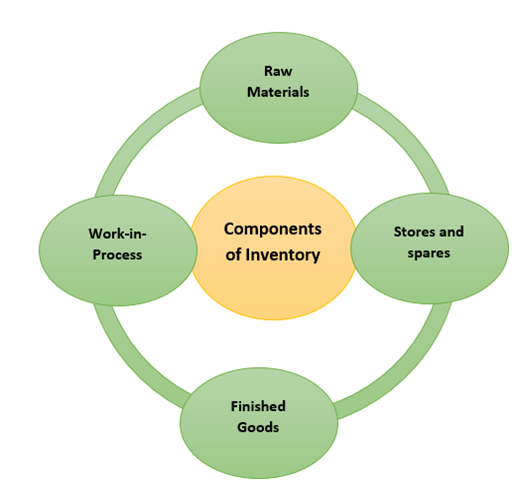
* Finished goods (that are available to be sold)
* Work-in-progress (meaning in the process of being made)
* Raw inventory (to be used to produce more finished goods)

Inventory is generally the largest current asset – items expected to sell within the next year – a company has.

Inventory is the goods that a business has on its premises or on [consignment](https://www.accountingtools.com/articles/2017/5/4/consignment). The essential role of inventory is to act as a buffer, allowing for the smooth functioning of the production and order fulfillment processes. The four components of inventory are defined as:

* [Raw inventory](https://www.accountingtools.com/articles/2017/5/13/raw-materials-inventory). This is the source material for a company's manufacturing process. It can literally be "raw" inventory that require considerable reconfiguration to become a product (such as sheet metal) or it can be components purchased from a supplier, and which can simply be bolted onto a product that is being assembled.
* [Work in process](https://www.accountingtools.com/articles/2017/5/13/work-in-process-inventory). This is raw inventory that are in the process of being transformed into finished products through a manufacturing process. This can be quite a small amount if the manufacturing process is short, or a massive amount if the item being created requires months of work (such as an airliner or a satellite).
* [Finished goods](https://www.accountingtools.com/articles/2017/5/10/finished-goods-inventory). This is products that have successfully completed the manufacturing process, and are ready for sale.
* [Merchandise](https://www.accountingtools.com/articles/2017/5/8/merchandise-inventory). This is finished goods that have been purchased from a supplier, and which are ready for immediate resale. Examples of merchandise are clothes sold at a retailer, or tires sold at a local automobile repair shop.

Inventory does not include supplies, which are considered to be charged to expense in the period purchased. Also, customer-owned inventory should not be recorded as inventory owned by the company. Further, supplier-owned inventory located on the premises should also not be recorded as inventory by the company.



**Objective for maintaining inventory:**

1. To ensure continuous supply of materials spares and finished goods so that production should not suffer at any time and the customer’s demand should also be met.

2. To avoid both overstocking and under-stocking of inventory.

3. To maintain investment in inventories at the optimum level as required by the operational and sales activities.

4. To keep materials cost under control so that they contribute in reducing cost of production and overall cost.

5. To eliminate duplication in ordering or replenishing stocks. This is possible with the help of centralising purchases.

6. To minimise losses through deterioration, pilferage, wastages and damages.

7. To design proper organisation for inventory management. Clear cut accountability should be fixed at various levels of the organisation.

8. To ensure perpetual inventory control so that materials shown in stock ledgers should be actually lying in the stores.

9. To ensure right quality goods at reasonable prices. Suitable quality standards will ensure proper quality stocks. The price analysis, the cost analysis and value analysis will ensure payment of proper prices.

10. To facilitate furnishing of data for short term and long term planning and control of inventory.

**Merits And Demerits of Keeping inventory**

**The Advantages of Holding a Large Amount of Inventory:**

**Customer Satisfaction**

In comparing the extremes of running out of stock and holding more inventory than you need, stock outs are definitely worse. If customers come to your business and you don't have goods they want, you risk alienating them and losing them to competitors. Carrying extra inventory in your retail storage area or in a nearby distribution center helps keep shelves fully stocked during periods of peak customer demand.

**Supplier Price Discounts**

One reason some resellers bite the bullet and carry extra inventory is because of the cost advantages from buying in bulk. Typically, if you order larger product lots, you get a lower cost per unit. This strategy improves your potential gross profit, since a lower cost of goods sold means you make more on each sale. Alternatively, if you operate as a low-cost provider, you could pass the discounts on to your customers and potentially increase your sales volume.

**Protection Against Order Delays**

Holding extra inventory gives you greater control. Though you can develop strong partnerships with suppliers, you can't always control the efficiency with which they ship goods after an order. Delays in processing replenishment orders could contribute to stock outs or low supplies when customers want the products most. In some cases, production or distribution may be affected by the weather, or factors beyond the control of your suppliers.

**Merchandising and Promotion**

Fully stocked shelves or promotional displays also contribute to effective in-store merchandising. An aesthetically-pleasing store setup is integral to keeping customers around and getting them to return to your store. Fully-stocked shelves give the impression that your company has good product variety and assortment. Displays and shelves also look better with good product supplies rather than bare spots. You can also strategically place high-demand goods in checkout aisles or near the front of the store to entice impulse buys.

**Quicker response time**

You are able to easily and quickly fill all customer orders as soon as they come in, without having to worry about waiting on your stock to come in to ship their order out. Customers can be lost if you can’t ship an order quickly.

**Decreased risk of shortages**

By keeping stock on hand, you are able to guarantee, up to a certain point, that you will not run out of a particular item, and you have less to worry about if a product is discontinued. Should there be a shift in the demand for your product, you are more able to meet (or even beat) the competition; you will be more likely to be able to sell your excess inventory at an ideal price.

**Quick replenishment**

By keeping excess inventory, you are able to work to make sure that your shelves are always full, and that your store always has a neat and tidy appearance.

**Disadvantages of holding excess inventory:**

**Tying up Cash flow**

The more inventory you have on hand, the greater the amount of the business’ capital is tied up. You will risk slowing down your business’ cash flow.

**Risk of inventory becoming obsolete**

The value and quality of your product decreases the longer you keep it on stock. You have to make it a priority to sell your inventory while they’re new to the market. Smart phones, for example, are updated almost every six months, so you have to sell your stock before new versions arrive. You might end up having to sell them at a smaller price because it has become outdated or obsolete. Similarly, if you are selling perishable goods, you would have to sell them at a much lower price the nearer it gets to its expiration date. You would potentially lose money on the item if it must be sold below cost in order to clear it out.

**Risk of item not selling**

By keeping excess inventory on hand, it’s possible that you have misjudged what will and what will not sell, and in doing so, you could end up with a large quantity of items on hand that people do not wish to purchase. Again, you might have to sell at a steep discount, or sell below cost to move the inventory out of your warehouse.

**Higher storage costs**

Excess inventory means extra space needed for storage. Extra space also means extra costs, and since you have to include those extra costs in your price, you might end up losing to competition with other sellers because your price is too high. Even if you have your own warehouse, you would still be having extra costs in maintenance, and you also risk not having enough space for new items.

**Risk of natural disasters**

Any type of stock is always at a risk of being destroyed or damaged by fires, floods, or other natural disasters. Having less of it in excess, however, would incur smaller losses should these natural disasters happen.

**Higher insurance premiums**

The more inventory you keep and the longer you keep it, the more insurance you pay on it.

**Introduction To Inventory Management**

The term inventory refers to the goods or materials used by a firm for the purpose of production and sale. It also includes the items, which are used as supportive materials to facilitate production.

There are three basic types of inventory: raw materials, work-in-progress and finished goods. Raw materials are the items purchased by firms for use in production of finished product. Work-in-progress consists of all items currently in the process of production. These are actually partly manufactured products. Finished goods consists of those items, which have already been produced but not yet sold.

Inventory constitutes one of the important items of current assets, which permits smooth operation of production and sale process of a firm. Inventory management is that aspect of current assets management, which is concerned with maintaining optimum investment in inventory and applying effective control system so as to minimize the total inventory cost.



**Importance Of Inventory Management**

**1. Protects from fluctuations in demand:**

Many a times, the demand forecast of a product is not accurate. There is always a small difference between the demand forecast and actual demand. However, sometimes, there is a big difference between the demand forecast and actual-demand.

So, there are always chances of fluctuations in the demand of a material. These fluctuations can be adjusted if there are sufficient items in the stock of inventory. Therefore, proper inventory control protects the company from fluctuations in demand.

**2. Better services to customers**

If the company maintains a proper inventory of raw-materials, then it can complete its production in time. So, it can deliver the finished goods to the customers in time.

Similarly, if the company has a proper inventory of finished goods, then it can satisfy the additional demand of the customers. So, inventory control helps the company to deliver goods at the right time as demanded by the customers. After making timely delivery, the company can concentrate on giving other services to the customers.

**3. Continuity of production operations**

Proper inventory control helps to maintain continuity of production operations. This is because it maintains a smooth flow of raw materials. So, there are no shortages of raw-materials required for production process.

**4. Reduces the risk of loss**

Proper inventory control helps to reduce the risk of loss due to obsolescence (outdated) or deterioration of items. This is because it checks all the items regularly.

Furthermore, it sells all the slow-moving items, in time, at the market prices. It only maintains the right stock at all times. So, the chances of any item getting outdated is reduced.

**5. Minimizes the administrative workload**

Proper inventory control helps to minimize the administrative work load of purchasing, inspection, warehousing, etc. This will reduce the manpower requirement and will minimize the labour cost too.

**6. Protects fluctuation in output**

Inventory control tries to reduce the gap between planned production and actual production. There are cases where the production schedule cannot be followed because of:

* 1. Sudden breakdown of machines,
  2. Problems in supply of materials,
  3. Sudden labour strikes,
  4. Loss due to failure of power supply, etc.

In such cases, the difference between planned production and actual production can be bridged by inventories held in stock.

**7. Effective use of working capital**

Proper inventory control helps to make effective use of working capital. Inventory control helps in maintaining the right amount of stocks of materials, components, etc. Over stocking is avoided. Therefore, the working capital will not be blocked in excess inventory.

**8. Check on loss of materials**

Inventory control helps to maintain a check on the loss of materials due to carelessness or pilferage (stealing).

If there is no proper inventory control, then there are more chances of carelessness and pilferage by the employees, especially in the store-keeping department.

9. **Facilitates cost accounting activities**

Inventory control facilitates cost accounting activities. This is because, inventory control provides a means of allocating materials cost of products, departments or other operating accounts.

10. **Avoids duplication in ordering**

Inventory control avoids duplication in ordering of stock. This is done by maintaining a separate purchase department. This department will do all the purchasing for the full organisation. No other department is allowed to do purchasing. So there will not be any duplication in ordering of stock.

# Objectives of Inventory Management: Primary and Secondary Objectives

The objectives of material management can be classified into two categories viz; primary objectives and secondary objectives.

**Primary Objectives:**

The following are the primary objectives:

**1. Low Prices:**

If inventory department succeeds in reducing the price of items it buys, it contributes in not only reducing the operating cost but also in enhancing the profits.

**2. Lower Inventories:**

By keeping inventories low in relation to sales, it ensures that less capital is tied up in inventories. This increases the efficiency with which the capital of the company is utilized resulting in higher return on investment. Storage and carrying costs are also lower.

**3. Reduction in Real Cost:**

Efficient and economical handling of inventory and storage lowers the acquisition and possession cost resulting in the reduction in the real cost.

**4. Regular Supply:**

Continuity of supply of inventory is essential for eliminating the disruption in the production process. In the absence of regular supply of inventory, production costs go up.

**5. Procurement of Quality Inventory:**

Inventory department is responsible for ensuring quality of inventory from outside suppliers. Therefore, quality becomes the single most objective in procurement of inventory.

**6. Efficient handling of Inventory:**

The effective material control techniques help the efficient handling of inventory resulting in the lowering of production cost.

7. **Enhancement of firm’s goodwill**:Good relations with the suppliers of inventory enhance the company’s standing in the society as well as in the business community.

**8. Locating and developing future Executives:**

Inventory manager must devote special effort to locate men at lower position who can take up the executive posts in future. It helps in developing talented personnel who are ready to undertake future responsibilities of the business relating to inventory management.

**9. Sufficient Inventory**

One objective of an inventory manager is to ensure that the inventory is stocked at all times to suit the needs of customers. This includes inventory systems that keep track of products ready for sale and inventories that track supplies or raw materials to create the final product. The company can lose sales and customers if products are not readily available when customers need them.

**10. Minimizing Unnecessary Capital**

All of the items in a company’s inventory are considered assets, because of the monetary value attached to the items. If the items in the inventory system expire or do not sell, the items become a less valuable or even a liability. An inventory management objective is to ensure that the inventory items are used when they have the original value, so the company does not lose money by having the inventory.

**11. Minimize Wastes and Losses**

An objective could be to conduct quality control to prevent losses and wastes by manually tracking all items in inventory. Inventory items may have an expiration date, rot or develop mold, break in the inventory hall or simply not satisfy company standards. Having waste and valuable losses is one of the major risks of running an inventory in a business. Losses can occur during the production stages due to employee theft or simply because the items have expiration dates.

**12. Storage of Items**

While losses and damaged inventory happen in most businesses, a large part of the damage can be prevented by storing items in a proper manner. An objective for an inventory manager could be to properly store inventory items and materials in a safe and effective manner. For instance, items that can rot and develop mold or have a paper-like texture should not be in a damp area.

**Secondary Objectives:**

The following are the important secondary objectives of inventory management.

**1. Reciprocity:**

The purchase of raw inventory from the organisations/customer’s by the concern and in turn, sale of finished products to the above customers is known as reciprocity. It serves the twin purpose of increasing purchasing as well as sales.

**2. New Developments:**

The staff of the inventory department deals regularly with the suppliers responsible for new developments in material handling. These developments can be successfully applied in material handling and management.

**3. Make or Buy Decisions:**

The material manager with regular reviews of cost and availability of inventory can safely conclude that whether the material is to be purchased or developed in the organisation itself.

**4. Standardisation:**

Standardisation of inventory is greatly helpful in controlling the material management process. With regular stock-taking, the non-standardised items can be rejected and standard components may be brought into product designs to reduce the cost of production. It is further helpful in promoting the standardisation with suppliers.

**5. Assistance to Production department:**

By supplying the standardised inventory or components to the production department, quality products can be assured. It is helpful in imparting the economic knowledge in bringing about the desired improvement in the product.

**6. Co-operation with other departments:**

Successful management of inventory department contributes to the success of every other department in the organisation. At the same time the success of inventory department depends on how successful it is in getting the co-operation of the staff of the other departments.

**7. Conception of future outlook:**

The inventory manager must have some conception of future outlook for prices, cost and general business activity. Forecasting can be made about the future trends in inventory. The inventory manager should be able to foresee the prices and costs of the raw inventory and general business conditions through their daily contracts with the suppliers.

**Functions/systems of Inventory Management:**

The functions of the inventory management are as follows:

1. The manager of the inventory has to take great care of time. He should be well aware that how much time a unit will take in processing and reaching the inventory so that the material does not get short in inventory.
2. Inventory management is also fed with the cost of all the raw items and their subsequent costs in finished form. Inventory management makes sure that the price of an item does not get too high after including all the taxes. It has to be attentive to all costs from production to packaging so that the prices should not get higher.
3. Inventory management is also responsible for observing the availability of all raw materials which to be used in completing all the orders. Managers have to make sure that all material is available so that all orders could get complete in time.
4. It is also a duty of an inventory manager that he keeps account of all raw materials and makes order for their reach in time so that the processing operation does not come to halt.
5. Inventory management is also liable for keeping all records of the ready products which has to be shipped. They have to be very clever in making calculation. The items for shipping should not be shorter than demanded by the clients. If it happens, inventory management can wreck the reputation of the organization.

**Pre- requisites for good Inventory Management**

1. **Suppliers Assistance/supplier contact:** An effective way to manage inventory is with the help of supplier. Supplier managed inventory gives the vendor access to the distributor’s inventory data.the supplier generates purchase order based on the distributor’s needs.
2. **Inventory control Personnel:** An efficient method for managing inventory is to hire a dedicated inventory control specialist. Inventory specialist manages all merchandise items that are on hand and in process.
3. **Lead Time:** lead time is the time it takes to reorder inventory. Suppliers deliver products a varying times after an order is placed.
4. **Control monetary level**: having high levels of inventory adds to expenses and increases costs.an effective way to manage inventory is to determine the inventory demands of the business.
5. **Customer Delivery:** an effective way to manage inventory is to measure inventory turnover and delivery turnaround time.
6. **Inventory Consultant:** inventory consultants (expert) are responsible for maintaining accuracy, counting, shipping and receiving and managing order sequence.
7. **Purchase of Software:** many businesses manage inventory by designing an inventory management database or purchasing management software.
8. **Product Turn around:** all businesses have products that sell and products that sit on the shelves. A helpful way to manage inventory is to establish a syatem that pinpoints which products move quickly and which products take more time.
9. **Tracking System:** all businesses develop a tracking system to manage inventory and monitor turnaround times. They provide complete inventory control allowing business owners to organize item levels and take cycle in distribution centers or stock rooms.
10. **Work in Progress:** establishing a system for “work in process” materials allows businesses to adjust order amounts before the inventory gets too low and slows production.

**UNIT -2 (A)**

**MATERIAL PURCHASE**

#### Meaning and Definition:

Purchasing is the first phase of Materials Management. Purchasing means procurement of goods and services from some external agencies. The object of purchase department is to arrange the supply of materials, spare parts and services or semi-finished goods, required by the organisation to produce the desired product, from some agency or source outside the organisation.

The purchased items should be of specified quality in desired quantity available at the prescribed time at a competitive price. In the words of Alford and Beatty, ”Purchasing is the procuring of materials, supplies, machines, tools and services required for equipment, maintenance, and operation of a manufacturing plant”.

According to Walters, purchasing function means ‘the procurement by purchase of the proper materials, machinery, equipment and supplies for stores used in the manufacture of a product adopted to marketing in the proper quality and quantity at the proper time and at the lowest price, consistent with quality desired.”

Thus, purchasing is an operation of market exploration to procure goods and services of desired quality, quantity at lowest price and at the desired time. Supplier who can provide standard items at the competitive price are selected.

Purchasing in an enterprise has now become a specialised function. It was experienced that by giving the purchase responsibility to a specialist, the firm can obtain greater economies in purchasing. Moreover purchasing involves more than 50% of capital expenditure budgeted by the firm.

According to Westing, Fine and Zenz “Purchasing is a managerial activity that goes beyond the simple act of buying. It includes research and development for the proper selection of materials and sources, follow-up to ensure timely delivery; inspection to ensure both quantity and quality; to control traffic, receiving, storekeeping and accounting operations related to purchases.” The modern thinking is that Purchasing is a strategic managerial function and any negligence will ultimately result into decrease in profits.

#### Importance of Purchasing:

1. Purchasing function provides materials to the factory without which wheels of machines cannot move.

2. A one percent saving in materials cost is equivalent to a 10 percent increase in turnover. Efficient buying can achieve this.

3. Purchasing manager is the custodian of his firm’s is purse as he spends more than 50 per cent of his company’s earnings on purchases.

4. Increasing proportion of one’s requirements are now bought instead of being made as was the practice in the earlier days. Buying, therefore, assumes significance.

5. Purchasing can contribute to import substitution and save foreign exchange.

6. Purchasing is the main factor in timely execution of industrial projects.

7. Materials management organisations that exist now have evolved out or purchasing departments.

8. Other factors like:

(i) Post-war shortages,

(ii) Cyclical swings of surpluses and shortages and the fast rising materials costs,

(iii) heavy competition, and

(iv) Growing worldwide markets have contributed to the importance of purchasing.

#### Objectives of Purchasing:

The purchasing objective is sometimes understood as buying materials of the right quality, in the right quantity, at the right time, at the right price, and from the right source. This is a broad generalisation, indicating the scope of purchasing function, which involves policy decisions and analysis of various alternative possibilities prior to their act of purchase.

The specific objectives of purchasing are:

1. To pay reasonably low prices for the best values obtainable, negotiating and executing all company commitments.

2. To keep inventories as low as is consistent with maintaining production.

3. To develop satisfactory sources of supply and maintain good relations with them.

4. To secure good vendor performance including prompt deliveries and acceptable quality.

5. To locate new materials or products as required.

6. To develop good procedures, together with adequate controls and purchasing policy.

7. To implement such programmes as value analysis, cost analysis, and make-or-buy to reduce cost of purchases.

8. To secure high caliber personnel and allow each to develop to his maximum ability.

9. To maintain as economical a department as is possible, commensurate with good performance.

10. To keep top management informed of material development which could affect company profit or performance.

11. To achieve a high degree of co-operation and co-ordination with other departments in the organisation.

**Write a short note on: Material requisition form:**

A material requisition form lists the items to be picked from [inventory](https://www.accountingtools.com/articles/2017/5/13/inventory) and used in the production process or in the provision of a service to a [customer](https://www.accountingtools.com/articles/2017/5/4/customer), usually for a specific job. The form usually has three purposes:

* To pick items from stock
* To relieve the inventory records in the amount of the items picked
* To charge the targeted job for the [cost](https://www.accountingtools.com/articles/2017/5/4/cost) of the items requisitioned

The form can also be used as the basis for the reordering of any inventory items that are not currently in stock.

The information most commonly found on a material requisition form includes:

* Header section: Job number to be charged
* Header section: Date of requisition
* Header section: Date by which inventory is required
* Main body: Item number or description to be pulled from stock
* Main body: Unit quantity to be pulled from stock
* Footer section: Authorization signature line

If the materials are to be delivered to a specific location, there may also be space in the header in which to identify the delivery location.

Unless a service invoice is to be prepared from this document, it usually does not include item costs or prices.

The requesting person retains a copy of the material requisition form, as does the warehouse staff. Another copy accompanies the picked goods to their eventual destination. If items listed on the form are not in stock, another copy may be sent to the purchasing department for ordering purposes.

[Auditors](https://www.accountingtools.com/articles/2017/5/5/auditor) may trace the flow of material requisition forms through a company, to see if inventory items are being appropriately used and recorded as mandated by company materials handling procedures. If not, the auditors may conclude that they cannot rely upon certain aspects of a company's control systems as part of their [audit](https://www.accountingtools.com/articles/2017/5/5/audit) activities, and so will bolster other audit activities.

The material requisition form is not used in a computerized production planning environment, where this picking information is instead sent to the warehouse as an electronic message.

**Similar Terms**: A material requisition form may also be known as a purchase requisition form; though a purchase requisition can be used for all types of purchases, not just those involved in the production process.

**Discuss process of material purchase:**

#### 1. Determining Purchase Budget:

Purchase Manager prepares a purchase budget for the forthcoming financial year. Purchase budget is prepared with the help of production planning department. It contains detailed information regarding quantity to be purchased, quality of materials, time of purchase and the sources of procurement. A schedule of materials and components needed for various jobs, known as bill of materials, is also prescribed for working out details of purchase budget. A bill of materials is also useful in exercising control over the utilization of materials.

#### 2. Receipt of Purchase Requisition:

The purchase officer initiates action for the purchase of materials only when he receives a request for the same. The store-keeper and departmental heads send requisition slips to purchase department giving details of materials required by their departments etc. A purchase requisition is a form used as a formal request to the purchasing department to purchase materials.

This form is prepared by the store keeper for regular stock materials and by the departmental head for specific materials not stocked as regular items. The store­keeper knows when an action or fresh procurements is to be initiated. He will send the requisition when materials reach re-ordering level. He retains one copy of the requisition with him for future reference .It is on the basis of purchase requisition that orders are placed for materials.

#### 3. Determining Sources of Supply:

Purchase Manager remains in touch with various suppliers of materials. The quotations are invited for the purchase of specific items. After receiving quotations a comparative study is made regarding terms and conditions offered. The factors to be considered include price, quantity, quality, time of delivery, terms of payment, trade discount and reputation of suppliers. After looking at various factors a final decision is taken about the supplier of goods.

#### 4. Placing Order:

After selecting a supplier a formal purchase order is sent for the supply of goods. A purchase order is sent on a printed form and is duly authorized by the purchase manager. This order should contain details about the quantity, quality, price, mode of delivery, terms of payment etc. The purchase order authorizes the vendor to dispatch goods specified in it. It establishes a contractual relation between the buyer and the vendor.

#### 5. Follow-Up of Purchase Order:

A purchase order normally bears a date by which the goods must be delivered It is in the interest of the organization that goods are received in time for keeping uninterrupted flow of materials. The suppliers may be reminded of the date of delivery of goods. A follow-up of purchase order is necessary to receive stocks in time.

#### Receipt and Inspection of Materials:

In big concerns the task of receiving materials is assigned to the purchase department whereas in small concerns this work is done by the store keeper. After unpacking goods their quantity is compared to that given in delivery challans. Any discrepancy in items is reported to the purchase department. The specifications and quality of goods is also checked at this stage.

#### Checking Invoices:

Lastly, purchase department checks the invoices supplied by the vendor with that of its own records. The quantity, quality, price, terms etc. are compared with those given in purchase order. After making full checking the invoices are sent to accounts department for payment.

**Explain the various function of purchasing**

The followings are some of the important functions which are necessary to be performed.

1. Receiving indents

2. Assessment of demand or description of need

3. Selection of sources of supply

4. Receiving of quotation

5. Placing order

6. Making delivery at the proper time by following up the orders.

 7. Verification of invoices

8. Inspection of incoming materials

9. Meeting transport requirements of incoming and outgoing materials

10. Maintaining purchasing records and files

11. Reporting to top management

12. Developing coordination among other departments

13. Creating goodwill of the organisation in the eyes of the suppliers

# Major Principles of Purchasing :

Some of the major principles of purchasing are: 1. Right Quality 2. Right Quantity 3. Right Time 4. Right Source 5. Right Price and 6. Right Place.

### 1. Right Quality:

The term right quality refers to a suitability of an item for the purpose it is required. For producing the goods of best quality, the best grade of raw material may be the right quality whereas for producing items of medium quality, the average lowest grade may be the right quality.

The quality of the item is called as grades. It can be measured by physical tests, chemical analysis or by any other methods depending upon the nature of a product. The use of standard specification, brand name or trade name helps in purchasing the squired qualities of materials. ‘The quality must be built into the product’. It is the duty of the purchasing department to ensure that materials are purchased from those suppliers.

For creating goodwill, right production, standardisation, elimination of waste and for better results, right quality purchases are very essential. Quality for different materials is decided by the concerned departments.

In case of workshop equipment, the decision is taken by the plant engineer and for stationery it is the user department. However, purchase department may question the requirements of the different departments on the basis of its experience and suggest various alternatives. The inspection department must verify whether the goods supplied are in accordance with the order placed.

Thus, the right quality is the suitability of items purchased for a given purpose. The best quality of materials purchased need not be the right quality.

### 2. Right Quantity:

Materials purchased should be of right quantity. The right quantity is the quantity that may be purchased at a time with the minimum total cost and which obviates shortage of materials. Ensuring and maintaining a regular flow of materials for carrying the production activity is the vital aim of any purchase organisation. Excess purchases should be avoided, it results in overstocking and capital is unnecessarily blocked and inventory carrying cost goes up.

Economic Order Quantity (EOQ) helps in determining the right quantity of materials to be ordered. It is calculated by applying the following formula:

EOQ =

A stands for annual consumption of material, C for cost of placing an order and S for Annual Storage and carrying cost per unit.

For dedicing the amount of right quantity to be purchased, certain important factors must be considered by the management. These are the nature of the manufacturing process, the nature of material to be used, prevailing market conditions i.e., changes in the tastes and preferences of the people, cost of materials to be purchased, cost of possession and storing capacity of the organisation.

Along with the economic order quantity, there are two more concepts, viz.; bulk order quantity and arbitrary order quantity which needs to be understood.

Bulk Order Quantity is the quantity which is larger than the economic order quantity. It combines the ordering quantity of more than one order so as to round off to 3, 6 or 12 monthly requirements and place a single order for the full requirements of a period under consideration.

Bulk order quantity ensures various economies of price, lesser operational cost in the purchase department. Inexpensive and slow moving items are generally purchased in bulk quantity.

Arbitrary Order Quantity is the outcome of the weaknesses of economic order quantity and bulk order quantity. Due to varying market conditions, it is not advisable to always strictly adhere to the economic and bulk order quantities.

Certain factors viz.; uncertain order from the market, uncertain financial position, uncertain production schedule and uncertain lead time are responsible for the adoption of arbitrary order quantity on the part of the purchase manager.

### 3. Right Time:

The time at which the purchases are to be made is of vital importance. In case of items used regularly, right time means the time when the stock reaches the minimum level. The reorder level of material is fixed for each item under the principle of right time.

Action for the purchase of new supplies should be immediately initiated, when the material reaches the reorder level. Reorder level for each type of material is calculated by applying the following formula.

Reorder level = Maximum Consumption x Maximum Reorder Period. The materials control department sends the purchase requisition to be purchase department for the purchase of materials. In case materials are required for special jobs, the Purchase Department ensures that the materials are delivered in time.

Another important factor to be considered is the delivery of materials from stores to production departments. Any under delay in supplying the materials on different jobs delays the production.

### 4. Right Source:

Selecting the right source for the purchase of materials is an important consideration in the purchase procedure. The right source for the procurement of materials is that supplier who can supply the material of right quality as ordered, in right quantity as ordered, at a right time at which the materials were required to be supplied, at an agreed price with the supplier, who is in a position to honour the commitment without much follow- up, who has necessary financial resources and adequate man-power to handle the order and who is well established with higher reputation and proven business integrity.

The source of material should be located within a reasonable distance from the buyer’s organisation. This will minimise the delivery delays, higher transportation charges and improve the personal contact between the buyer and the supplier and enable better after-sales service etc.

As far as possible the middlemen and brokers should be avoided in the purchase of materials. A direct liaison should be established with the supplier. It would be helpful in improving the quality of the material in future.

While selecting the supplier certain factors must be kept in mind, viz., location of the supplier, warehousing facilities available with the supplier, relations of the employers with the labour, credit worthiness of the supplier, size of the supplier’s firm and quality control observed by the employer etc. A personal visit to prospective supplier’s premises will be helpful in assessing the capabilities of the supplier.

### 5. Right Price:

Determination of right price is a difficult task. It is the main object of any organisation to procure the material items at the right price. It is that price which brings the best ultimate value of the money invested in purchasing the materials.

Deciding the right price of a product depends on variety of factors, viz.; quality, delivery time and ultimate life of the material, demand and supply curve, extent of competition, government restrictions, after sales services, discount offered, and terms of purchase etc. It may be pointed out here that the determination of proper price depends not only on market knowledge but also a clear understanding of the pricing process.

The buyer should keep in touch himself with the above mentioned factors in the process of determination of price. He must consider that whether a proposed item to be purchased represents the best value for money or not.

This is known as “value analysis”. The prevailing market prices also provide basis for the price determination. There should be negotiation between the purchase department and the suppliers for the determination of proper price.

### 6. Right Place:

Besides obtaining the materials of the right quality and quantity from the right source at the right price, it should be ensured that the materials are available at the right place. Transportation and material handling costs are greatly affected by the selection of the right place from where the materials are to be acquired. For minimising these costs, selection of right place for the acquisition of material is of utmost importance. If local as well as outside supplier fulfills these conditions, the former should be preferred. The above mentioned principles of purchasing can be summed up as the six R’s of purchasing. These are also known as the “essentials” to be followed by the purchasing executive.

## Define types of tenders:

## Single Tender : When only one source of supply is available then single tender is addressed to the selected supplier. b.) Limited Tender : This type of tender is addressed to a limited number of suppliers, who are the reliable source of supply. c.) Open Tender : is open to all the suppliers within the country who can supply the required quantity and quality of materials. Such invitation is made by advertising in newspapers, journals etc. d.) Global Tender: is open to anybody from any part of the world to supply the required quantity and quality of materials.

**Discuss about the documents used during purchase process:**

The normal process of purchasing, storing, control and issue of materials consists of the following documents:- 1. Bill of Materials 2. Purchase Requisition 3. Purchase Order 4. Material Inspection Note 5. Goods Received Note (GRN) 5. Goods Received Note (GRN) 6. Stores Requisition Note 7. Material Transfer Note 8. Material Return Note 9. Bin Card 10. Stores Ledger.

#### Document # 1. Bill of Materials:

Bill of Materials is a comprehensive list of materials, with specifications, material codes and quantity of each material required for a particular job, process or production unit. It will also include the details of substitute materials. It is prepared by the engineering or planning department for submission of quotation and after the receipt of work order. It is a method of documenting materials required for execution of the specified job work.

#### Document # 2. Purchase Requisition:

The manager in-charge of Purchase Department should obtain requisition from the Stores in- charge, departmental head or similar person requiring goods before placing orders on suppliers. If the present stock run down to the reorder level, then the stores department send a Purchase Requisition to Purchase Department, authorizing the department to order further stock.

#### Document # 3. Purchase Order:

If the Purchase Requisition received by the Purchasing Department is in order then it will call for tenders or quotations from the suppliers of materials. It will send enquiries to prospective suppliers giving details of requirement and requesting details of available materials, prices, terms and delivery etc. Quotations will then be compared and will place order with those suppliers who will provide the necessary goods at competitive prices.

The number of copies of routing of Purchase Orders depends on the procedure followed in the organization. Normally, the copies of the purchase orders will be sent to the Supplier, Department originating Purchase Requisition, Inspection Department, and Accounting Department.

#### Document # 4. Material Inspection Note:

When materials are delivered, a supplier’s carrier will usually provide a document called ‘delivery note’ or ‘delivery advice’ to confirm the details of materials delivered. When materials are unloaded, the warehouse staff check the material unloaded with the delivery note. Then the warehouse staff prepares a Materials Receipt Note, a copy of which is given to the supplier’s carrier as a proof of delivery.

After receiving the materials the Inspection Department thoroughly inspects whether the quality of material is in accordance with the purchase order and the quality of material received and it prepares a note called ‘material inspection note’, copies of which are sent to the supplier and stores department.

#### Document # 5. Goods Received Note (GRN):

Once the inspection is completed, GRN is prepared by the stores department, and copies of GRN is sent to the purchasing department, costing department, accounts department and production department, which initiated purchase requisition.

#### Document # 6. Stores Requisition Note:

It is also called ‘materials requisition note’. When Production or other departments requires material from the stores it raises a requisition, which is an order on the stores for the material required for execution of the work order. This note is signed by the department in-charge of the concerned department. It is documents which authorize the issue of a specified quantity of materials.

#### Document # 7. Material Transfer Note:

If materials are transferred from one department or job to another within the organization, then material transfer note should be raised. It is a record of the transfer of materials between stores, cost centres or cost units showing all data for making necessary accounting entries.

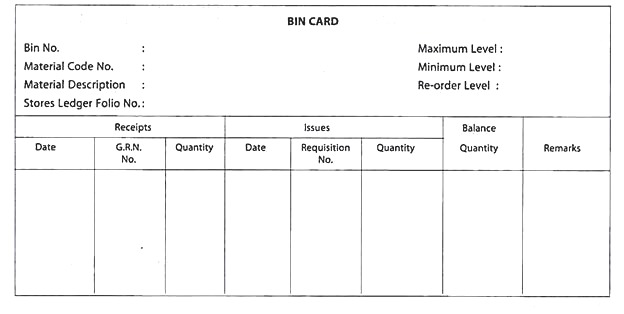
#### Document # 8. Material Return Note:

If materials received from the stores are not of suitable quality or if there is surplus material remaining with the department, they are returned to stores with a note called ‘material return note’ evidencing return of material from department to stores.

#### Document # 9. Bin Card:

A ‘bin card’ indicates the level of each particular item of stock at any point of time. It is attached to the concerned bin, rack or place where the raw material is stored. It records all the receipts of a particular item of materials and its issues. It gives all the basic information relating to physical movements. It is a record of receipts, issues and balance of the quantity of an item of stock handled by a store.

**A specimen bin card is shown below:**

[](http://cdn.accountingnotes.net/wp-content/uploads/2016/12/clip_image016.jpg)

#### Document # 10. Stores Ledger:

Stores department will maintain a record called ‘stores ledger’ in which a separate folio is kept for each individual item of stock. It records not only the quantity details of stock movements but also record the rates and values of stock movements.

With the information available in the stores ledger, it is easier to ascertain the value of any stock item at any point of time. The minimum, maximum and reorder levels of stock are also mentioned for taking action to replenish the stock position.

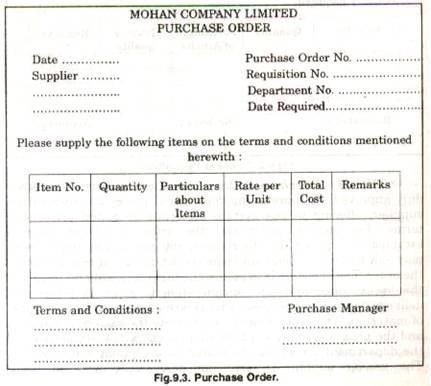
**UNIT -2 (B)**

## MATERIAL RECEIVING AND INSPECTION OF GOODS

**Explain the meaning of material Receiving.**

The receiving department performs the function of unloading and unpacking materials which are received by an organisation. In this task, the receiving department does many activities, such as counting materials received, making physical inspection of goods received, comparing goods received with the description on the purchase order, making a record of goods received, notifying the purchasing department of discrepancies discovered and damage in transit.

Both the condition and quality of the materials may need checking and for materials or parts with a high degree of accuracy and performance, a formal inspection may be necessary. This will need an inspection report which is sometimes incorporated in the receiving report, indicating the items accepted and rejected, with reason. Two functions are performed by the receiving report.

[](http://www.shareyouressays.com/wp-content/uploads/hindi/5-Important-Steps-in-Purchasing-and-Rece_992B/clip_image006.jpg)

(i) It notifies the accounting department that the materials have been received and that a voucher can be prepared for payment.

(ii) It determines and places initial responsibility for materials on the receiving clerk and the receiving clerk continues to have this responsibility until delivery is made to the store room. In some business firms, the store department functions as the receiving department also.

Several copies of the receiving report or goods received note (Fig. 9.4) are prepared; one going to each department interested in the arrival of materials, including stores, buying and accounts departments.

Write a Short note on Material inspection

# Definition and meaning : An **inspection** involves checking something, i.e., examining and assessing something. We may inspect a building or organization to make sure that it meets specific standards. The inspectors need to ensure that nothing is faulty and that nobody is breaking any laws. They also have to make sure that whatever they are inspecting is safe.

In the world of business, inspection is the critical appraisal of materials, items, or systems involving examination, testing, and gauging. Inspectors take measurements and make comparisons. Inspections are formal evaluations or organized examination exercises.

The inspectors determine whether the item or material is in proper condition and of the right quantity. They also determine whether it conforms to the company’s, industry’s, local, or national rules and regulations.

Inspection is an important tool to achieve quality concept. It is necessary to assure confidence to manufacturer and aims satisfaction to customer. Inspection is an indispensable tool of modern manufacturing process. It helps to control quality, reduces manufacturing costs, eliminate scrap losses and assignable causes of defective work.

The inspection and test unit is responsible for appraising the quality of incoming raw materials and components as well as the quality of the manufactured product or service. It checks the components at various stages with reference to certain predetermined factors and detecting and sorting out the faulty or defective items. It also specified the types of inspection devices to use and the procedures to follow to measure the quality characteristics.

Inspection only measures the degree of conformance to a standard in the case of variables. In the case of attributes inspection merely separates the nonconforming from the conforming. Inspection does not show why the nonconforming units are being produced.

Inspection is the most common method of attaining standardization, uniformity and quality of workmanship. It is the cost art of controlling the production quality after comparison with the established standards and specifications. It is the function of quality control. If the said item does not fall within the zone of acceptability it will be rejected and corrective measure will be applied to see that the items in future conform to specified standards.

**Objectives of Inspection**

1. To detect and remove the faulty raw materials before it undergoes production.
2. To detect the faulty products in production whenever it is detected.
3. To bring facts to the notice of managers before they become serous to enable them discover weaknesses and over the problem.
4. To prevent the substandard reaching the customer and reducing complaints.
5. To promote reputation for quality and reliability of product.

**Purpose of Inspection**

1. To distinguish good lots from bad lots.
2. To distinguish good pieces from bad pieces.
3. To determine if the process is changing.
4. To determine if the process is approaching the specification limits.
5. To rate quality of product.
6. To rate accuracy of inspectors.
7. To measure the precision of the measuring instrument.
8. To secure products-design information.
9. To measure process capability.

**Types of inspection are:**

1. Floor inspection
2. Centralized inspection
3. Combined inspection
4. Functional inspection
5. First piece inspection
6. Pilot piece inspection
7. Final inspection
8. **FLOOR INSPECTION**

In this system, the inspection is performed at the place of production. It suggests the checking of materials in process at the machine or in the production time by patrolling inspectors. These inspectors move from machine to machine and from one to the other work centers. Inspectors have to be highly skilled. This method of inspection minimize the material handling, does not disrupt the line layout of machinery and quickly locate the defect and readily offers field and correction.

**Advantages**

* + Detection of errors of the source reduces scrap and rework.
  + Correction is done before it affects further production, resulting in saving cost of unnecessary work on defective parts.
  + Material handling time is reduced.
  + Job satisfaction to worker as he can’t be held responsible for bad work at a later date.
  + Greater number of pieces can be checked than a sample size.
  + Does not delay in production.

**Disadvantages**

* + Delicate instruments can be employed.
  + Measuring or inspection equipment have to be recalibrated often as they are subjected to wear or dust.
  + High cost of inspection because of numerous sets of inspections and skilled inspectors.
  + Supervision of inspectors is difficult due to vibration.
  + Pressure on inspector.
  + Possibility of biased inspection because of worker.

**Suitability**

* + Heavy products are produced.
  + Different work centers are integrated in continuous line layout.

1. **CENTRALISED INSPECTION**

Inspection is carried in a central place with all testing equipment; sensitive equipment is housed in air-conditioned area. Samples are brought to the inspection floor for checking. Centralized inspection may locate in one or more places in the manufacturing industry.

**Advantages**

* + Greater degree of inspection due to sensitive equipment.
  + Less number of inspectors and tools.
  + Equipment needs less frequency of recalibration.
  + Cost of inspection is reduced.
  + Unbiased inspection.
  + Supervision of inspectors made possible.
  + No distraction to the inspector.

**Disadvantages**

* + Defects of job are not revealed quickly for prevention.
  + Greater material handling.
  + High cost as products are subjected to production before they are prevented.
  + Greater delay in production.
  + Inspection of heavy work not possible.
  + Production control work is more complicated.
  + Greater scrap.

1. **COMBINED INSPECTION**

Combination of two methods whatever may be the method of inspection, whether floor or central. The main objective is to locate and prevent defect which may not repeat itself in subsequent operation to see whether any corrective measure is required and finally to maintain quality economically.

1. **FUNCTIONAL INSPECTION**

This system only checks for the main function, the product is expected to perform. Thus an electrical motor can be checked for the specified speed and load characteristics. It does not reveal the variation of individual parts but can assure combined satisfactory performance of all parts put together. Both manufacturers and purchasers can do this, if large number of articles is needed at regular intervals. This is also called assembly inspection.

1. **FIRST PIECE OR FIRST-OFF INSPECTIONS**

First piece of the shift or lot is inspected. This is particularly used where automatic machines are employed. Any discrepancy from the operator as machine tool can be checked to see that the product is within in control limits. Excepting for need for precautions for tool we are check and disturbance in machine set up, this yields good result if the operator is careful.

1. **PILOT PIECE INSPECTION**

This is done immediately after new design or product is developed. Manufacturer of product is done either on regular shop floor if production is not disturbed. If production is affected to a large extent, the product is manufactured in a pilot plant. This is suitable for mass production and products involving large number of components such as automobiles aero planes etc., and modification are design or manufacturing process is done until satisfactory performance is assured or established.

1. **FINAL INSPECTION**

This is also similar to functional or assembly inspection. This inspection is done only after completion of work. This is widely employed in process industries where there are not possible such as, electroplating or anodizing products. This is done in conjunction with incoming material inspection.

**Methods of Inspection**

**There are two methods of inspection. They are: 100% inspection and sampling inspection.**

1. **100% INSPECTION**

This type will involve careful inspection in detail of quality at each strategic point or stage of manufacture where the test is involved is non-destructive and every piece is separately inspected. It requires more number of inspectors and hence it is a costly method. There is no sampling error. This is subjected to inspection error arising out of fatigue, negligence, difficulty of supervision etc.

Hence, completer accuracy of influence is seldom attained. It is suitable only when a small number of pieces are there or a very high degree of quality is required. Example: Jet engines, aircraft, medical and scientific equipment.

1. **SAMPLING INSPECTION**

In this method randomly selected samples are inspected. Samples taken from different patches of products are representatives. If the sample proves defective, the entire concerned is to be rejected or recovered. Sampling inspection is cheaper and quicker. It requires less number of Inspectors. It is subjected to sampling errors but the magnitude of sampling error can be estimated.

In the case of destructive test, random or sampling inspection is desirable. This type of inspection governs wide currency due to the introduction of automatic machines or equipments which are less susceptible to chance variable and hence require less inspection, suitable for inspection of products which have less precision importance and are less costly. Example: Electrical bulbs, radio bulbs, washing machine etc.

**Drawbacks of Inspection**

Following are the disadvantages of inspection:

1. Inspection adds to the cost of the product but not for its value.
2. It is partially subjective, often the inspector has to judge whether a products passes or not.
3. Fatigue and Monotony may affect any inspection judgment.
4. Inspection merely separates good and bad items. It is no way to prevent the production of bad items.

### Advantages/importance of Inspection or Materials

The following are the main **advantages of inspection**:

1. Ensure the right quality helps in maintaining a steady development and a high standard of living.
2. Enhanced [goodwill](https://www.playaccounting.com/explanation/exp-oa/goodwill/) because of high-quality production, that too, at a lower cost since the inspection assures quality production.
3. Procurement of statement items, again affecting favorably the cost curve because of lesser wear and tear and wastage, etc.
4. Increase in profitability.

**Explain the procedure for material receiving.**

This document provides guidelines governing receipt of goods purchased by York’s Purchasing Department. Delivery of requested products / goods marks a transition in the Purchase-to-Pay process from a purchasing activity to a payables activity.  All purchases must be “received” to release payment to the supplier.  The “receiving” department must determine if the products or services received are acceptable and conform to the terms and conditions of the purchase order.  The entire receiving process consists of the following:

**Receiving** – The act of taking possession of products in order to stage them for inspection, place them into inventory, or deploy them to end user (Requester) for immediate use.

**Inspecting** – the act of examining products that have been delivered to determine conformance to the purchase specifications.

**Acceptance** – Acknowledging that the products and/or goods conform to the requirements of the purchase order so that the supplier may be paid.  Shipments are considered “accepted” if the customer (requester of the item) acknowledges receipt to Accounts Payable and do not have a quality or delivery issue. Most shipments are considered accepted and approved for payment by the recipient (requester) by the generation of a receiving ticket (report) unless the recipient contacts Procurement or Accounts Payable and requests a hold on payment.

## ****Receiving****

**Signing for Deliveries**

Whenever possible, the person receiving the product should sign the receiving documents provided by the supplier or shipping company.  The person receiving the delivery should inspect the items before signing the receipt and should also initial the packing list. Then, submit the packing list to the appropriate person (Accounts Payable, Requester, Asset Management) for financial reconciliation.

**Refusing Delivery**

Whenever possible, departments should refuse to accept shipments if they are unable to confirm that the order was placed by their department, or if the packing appears sufficiently damaged to warrant concern.

**Record Retention**

During the receiving process, the Receiving Department takes physical possession and legal ownership of the shipment.  Therefore, it is important for the supplier to provide the department with a packing list for all shipments delivered to the department.

If the supplier fails to provide the packing list, the department should contact the supplier to request that copies be sent to the department for its files.

Department must keep receiving documents on file in accordance with these guidelines. The need for saving receiving documents is particularly important when accepting any partial or staggered deliveries over a period of time.

## ****Inspecting****

**Inspecting a Shipment**

Persons receiving shipments should, upon acknowledging receipt of an order, conduct an inspection to verify the following minimum conditions:

* The products conform to the purchase order requirements and other relevant documents (for example: correct model number, description, size, type, color, ratings, etc.)
* The quantity ordered against the quantity shipped or delivered.
* There is no damage or breakage.
* The unit of measurement count is correct (e.g. if the unit of measurement on the purchase order is one dozen, there should be 12 in the package).
* Delivery documentation (packing list, certifications, etc.) is acceptable.
* Perishable items are in good condition and expiration dates have not been exceeded.
* Products are operable or functional.

**Product Substitutions and Over-Shipments**

Suppliers are not allowed to substitute products or deliver more than the amount ordered without prior approval from either the department or the Purchasing Agent.  The Purchasing Agent should be notified by the Department whenever this occurs.

**Partial Deliveries**

Departments should contact the appropriate Purchasing Agent whenever a purchase is received as a partial delivery without acknowledgement or notification from the supplier.  This information is typically noted on the packing list.

**Failed Inspections**

Departments are advised to notify in writing any failed inspection results discovered during inspection and provide the results to the supplier and the Purchasing Agent for appropriate action.  When receiving items from freight companies, the number of packages received should match exactly the number on the freight bill.  If not, the Department should require the driver to write the number of packages received on the bill before signing.  Inspect all packages for damage to the outside container.  Any visual damage should also be noted on the freight bill before signing.

In cases of concealed damage, a report should be made by the Department immediately to the delivering carrier.  The report should include the following information: Freight Bill Number, Purchase Order number, the date of delivery, supplier, and the extent of damage or shortage.  In the event of damage, it is essential that the Department retain all the original shipping cartons for inspection by a claims adjuster.

## ****Acceptance****

**Determining Acceptance**

Departments are required to contact the supplier in a timely manner when rejecting products that are over-shipments, defective or for any other non-conformance.  Failure to notify the supplier and/or Purchasing Agent in a timely manner will mean the shipment will be considered “accepted”.

**Securing Rejected Products in a Secure Area**

Departments are responsible for storing rejected products in a secured area until the products are either shipped back to the supplier, or the supplier takes possession of the products and removes them from university property.

**Tagging Fixed Assets**

Following acceptance of capital items, departments are to ensure that Asset tags are affixed to capital equipment as provided by the university policy governing fixed assets.

**Product Returns for Credit/Refund**

When a supplier has shipped items as specified on a purchase order, they have legally complied with their part of the contract and are under no obligation to accept returned items for credit or refund.  Acceptance of a return by a supplier is not automatic; and if accepted, a restocking fee of 5% - 25% of the original item cost is sometimes charged by the supplier.  This charge will have to be paid by the requisitioning department.

When an item is received from a supplier that has been damaged, or is rejected for failing acceptance testing or is not as specified on the purchase order, the department should return a Return Authorization Number from that Supplier.  The shipping label on the returned package must be marked with the Return Authorization Number.  Other identifying information should be placed on the outside of the returned package for easy identification when received by the supplier.  No item should be returned without prior authorization from the supplier.  Procurement Services can assist in securing credit or refunds from the suppli

**UNIT -3(A)**

**Material Storage**

**Meaning of material storage:** A **material storage** location is a division of a business unit used to store **material** and to track **inventory** transactions. Your **material storage** locations might include shipping and receiving docks, staging areas, **warehouse** zones, inspection areas, and quality **control** departments.

**Objectives of material storage:**

* To minimize the cost of production.
* Time saving
* Providing better services to customer.
* Providing advice to management,
* Helps in establishing in coordination

# Store-Keeping: Meaning, Types, Objectives Functions and Working of the Stores

### Meaning:

After the completion of purchase procedure, the next important aspect Of materials management is storekeeping.

A storehouse is a building provided for preserving materials, stores and finished goods. The in-charge of store is called storekeeper or stores manager. The organisation of the stores department depends upon the size and layout of the factory, nature of the materials stored and frequency of purchases and issue of materials.

According to Alford and Beatty “storekeeping is that aspect of material control concerned with the physical storage of goods.” In other words, storekeeping relates to art of preserving raw materials, work-in-progress and finished goods in the stores.

### Types:

Stores may be centralised or decentralised. Centralised storage means a single store for the whole organisation, whereas decentralised storage means independent small stores attached to various departments. Centralised storekeeping ensures better layout and control of stores, economical use of storage space, lesser staff, saving in storage costs and appointment of experts for handling storage problems. It further ensures continuous stock checking. It suffers from certain drawbacks also. It leads to higher cost of materials handling, delay in issue of materials to respective departments, exposure of materials to risks of fire and accident losses are practical difficulties in managing big stores.

On the other hand, decentralised stores involve lesser costs and time in moving bulky materials to distant departments and are helpful in avoiding overcrowding in central store. However, it too suffers from certain drawbacks viz., uniformity in storage policy of goods cannot be achieved under decentralised storekeeping, more staff is needed and experts may not be appointed.

### Objectives of storekeeping:

Following are the main objectives of an efficient system of storekeeping:

1. To ensure uninterrupted supply of materials and stores without delay to various production and service departments of the organisation.

2. To prevent overstocking and understocking of materials,

3. To protect materials from pilferage, theft fire and other risks.

4. To minimise the storage costs.

5. To ensure proper and continuous control over materials.

6. To ensure most effective utilisation of available storage space and workers engaged in the process of storekeeping.

### Functions of Storekeeping:

In the light of above objects, the functions performed by the stores department are outlined below:

1. Issuing purchase requisitions to Purchase Department as and when necessity for materials in stores arises.

2. Receiving purchased materials from the purchase department and to confirm their quality and quantity with the purchase order.

3. Storing and preserving materials at proper and convenient places so that items could be easily located.

4. Storing the materials in such a manner so as to minimise the occurrence of risks and to prevent losses due to defective storage handling.

5. Issuing materials to various departments against material requisition slips duly authorized by the respective departmental heads.

6. Undertaking a proper system of inventory control, taking up physical inventory of all stores at periodical intervals and also to maintain proper records of inventory.

7. Providing full information about the availability of materials and goods etc., whenever so necessary by maintaining proper stores records with the help of bin cards and stores ledger etc.

**Working of the stores:**

There are four sections in the process of storekeeping viz.

(a) Receiving section,

(b) Storage section,

(c) Accounting section, and

(d) Issue section.

These are explained as under:

(a) **Receiving Section:**

There are four kinds of inventories received by stores viz., (i) raw materials, (ii) stores and supplies, (iii) tools and equipments, (iv) work-in- progress or semi-finished goods.

Following procedure is followed in receiving these inventories:

(i) Receiving these incoming materials in stores.

(ii) Checking and inspection of these incoming materials and stores etc.

(iii) Recording the incoming materials in goods received book.

(iv) Preparing and forwarding goods inwards note to purchasing section.

(v) Informing the purchase department about damaged and defective goods and surplus or deficit supplies etc. along with rejection forms and notes.

(vi) Returning damaged or defective goods to the suppliers in accordance with the instructions of the purchase department.

(vii) Forwarding the materials to respective stores and locations where these are to be stored or preserved.

**(b) Storage Section:**

The store room should be located at a convenient and appropriate place. It should have ample facilities to store the materials properly viz. bins, racks and shelves etc. There can be a single store room in case of a small organisation, but a large scale concern can have different or multiple stock rooms in addition to general or main store.

The separate stockrooms may be used for different classes of inventories. The material should be stored in such a manner as to protect it against the risks of damage, destruction and any kind of loss. Each article should have identifying marks viz., stamping, embossing, colour, coding and painting etc. These risks are very useful in locating or identifying an article in the stores.

**(c) Accounting Section:**

This section is concerned with keeping proper records with regard to receipt and issue of materials. The primary task of this section is to undertake the process of inventory control.

**(d) Issue Section:**

The materials should be issued to respective departments on receiving duly authorised requisition slips. An entry should be made immediately on the bin card attached with the bin from where the material has been issued.

Bin cards contain valuable information with regard to receipt and issue of materials, which is greatly helpful in exercising a system of inventory control. These cards are further helpful in determining various levels of materials viz., maximum, minimum, and re-ordering level.

**Types/formation of material storage organization:**

**Meaning of centralized stores**

A centralized store is that store which receives materials for and issues them to all departments, divisions and production floors of the company. Such a store is only one in the company which receives materials for and issues to all who need them. The materials required for all the departments and branches are stored and issued by only one store.

**Advantages Of Centralized Stores**

The followings are the main advantages of centralized stores.

1. A better supervision of store is possible because the store is located under a single supervision.

2. A better layout of store and its control are possible.

3. Less space is occupied.

4. Investment in stock is minimized.

5. It is economical for storing materials.

6. Safety of materials is possible according to the nature of materials.

7. Trained and specialized persons can be appointed.

8. Wastage of materials can be minimized.

**Disadvantages Of Centralized Store**

The followings are the main disadvantages of centralized stores.

1. Delay in sending materials to the departments and branches.

2. Increase in material handling cost.

3. Greater risk of loss by fire.

4. Not suitable for a large company.

**Meaning Of Decentralized Stores**

A decentralized store is that type of store which receives materials for and issues them to only one department and not to the whole company. The decentralized store may be in many numbers in the company, as each department has its own such store. Purchasing and handling of materials are undertaken by each and every department separately. If the volume of material activities is large, this type of store is suitable because each and every branch has their own store for facilitating smooth operations of their production activities.

**Advantages Of Decentralized Stores**

* Controlling a and storing function can be accomplished easily.
* Delay in material handling will be eliminated.
* Minimizes the chances of loss by fire.
* No need of internal transportation costs.
* . Specific needs of individual departments can be easily fulfilled.
* Saving in material handling cost.

**Disadvantages Of Decentralized Stores**

1. Higher cost of supervision.

2. More space is required for individual departments.

3. Higher amount of investment is required.

4. More time for stock taking and taking.

5. Higher cost of staff and stationary.

6. Improved technique is less possible for controlling of materials.

**Concept And Meaning Of Central Store With Sub Stores**

This is a mixed store system, a mix of centralized and decentralized stores. Under this store system, sub-stores are established in different departments according to the requirement of the company. Sub-stores are maintained at each department when the central store is at a distance from the production department. Such sub-stores are managed and controlled bu the central store itself. At the beginning of a period, the central store issues a fixed quantity of materials to the sub-stores. At the end of the period, sub-stores send a filled requisition form to the central store to maintain the stock to a predetermined level.

**Advantages Of Central Stores With Sub-stores**

1. Overcoming the demerits of centralized stores.

2. Offering an easier location for storing of materials.

3. Avoiding delay in issuing materials.

4. Providing services to meet the special needs of individual departments.

5. Reducing the internal transportation cost.

**Disadvantages Of central stores with sub-stores**

**1**. High cost for stationary and staffing.

2. High material handling cost.

3. More time in stock taking.

4. Extra set-up cost.

5. Complicated store control.

**Discuss the factors affecting in formation of material organization.**

A good store-keeping relies on how it provides economy of time, expenditure and employees. The right yardstick of making a judgement of its success is to discover the smooth functioning of the production department, if at all. Therefore, a successful store-keeping needs to possess the following features:

**Store Location:** ‘Location’ means the site for the store. The location of the stores should be carefully planned. An important factor to be considered when establishing a store set up is the question of locating it in the most appropriate place. The stores must be set up at a convenient and safe place, near to Receiving Department, easily accessible from all parts of the factory and by means of transport and free from the risk of fire, theft, etc. The general principle in determining the location of stores is to minimize the total kg. — km. cost of transportation of materials.

**Store/Warehouse Layout:** ‘Layout’ of stores refers to the physical arrangement of storage facilities or the internal arrangement or placement of materials inside the stores. Layout of stores aims at effective utilization of space available for storage of materials, making the receipt and issue of stores convenient, giving a better appearance to the store and reducing the chances of damage, wastage, pilferage and accidents.

Other factors are….as below:

* **Computerization of Records**
* **Material Classification and Codification**
* **Material Preservation**
* **Material Handling Equipment**

**Write a Note on :“Bin Card”.**

Bin card is the statement of all the receipts and issue of the stock from the store department. It is also called stock card or bin tag. It is the responsibility of the store keeper to write every in and out of stock from the store. The physical stock count and the stock quantity reported according to the bin card should be equal; otherwise internal audit department will have the right to investigate the matter with management.

Bin card only contain quantity column for both and receipts and at the close of each transaction, the stock level is calculated to make sure that at every point of time, it can be reconciled with the physical count.

Inventory management is not an easy task. That is why, it is crucial to control the flow of the inventory using some effective tools. One of the best tool to exercise tight control over the inventory is the Bin Card. Not just it helps in controlling the inventory very well, it also helps in maintaning an effective working capital. By knowing the pattern of the stock movement, an entity can easily determine how much capital, it should invest in the purchasing of t he inventory and for how much quantity. As a result, better working capital policies can be developed that will improve the liquidity of the company.

**Advantages of Bin Card**

As bin card is maintained for each item of inventory, the store keeper is well aware about the stock position. On each bin card, he or she can write the minimum stock and maximum stock level so that in case, any item of inventory is touching minimum level, he or she can create a purchase requisition for the fresh supply of the stock. Bin card is an important inventory control technique and is used in various formats. There is no specific format for the bin card as organization can design their own stock card according to their requirements and reporting analysis.

Bin Card can be maintained in the Excel or can be taken as hard copy print out format that store incharge can use. For your comfort, we are including the Bin Card in the following format:

Bin Card Format in [Excel](https://drive.google.com/file/d/1hQhh5wYYRGq74xI1bzs8ZZn-9avn1ezn/view?usp=sharing) | [Bin Card Format Pdf](https://drive.google.com/file/d/1xwcxcyppeezgAbz0RVc37ZrB26oiGSCA/view?usp=sharing)

**ABC Company**

**Specimen Bin Card Format**

|  |  |
| --- | --- |
| Bin card #:  Code #:  Material name:  Location:  Stores ledger folio: | Maximum stock level:  Minimum stock level:  Recorder level:  In charge: |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Receipts** | | **Issues** | | **Balance** | **Checked & Verified By** | | |
|  | G.R.N | Qty | Requisition # | Qty | Qty | Date | Name | Initial |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

**Difference between Bin Card and Stores Ledger**

|  |  |
| --- | --- |
| **Bin Card** | **Stores Ledger** |
| 1. It is used only to record receipts and issues of quantity and the balance therein.  2. It is maintained by the store in-charge or store keeper.  3. It is kept inside the store department.  4. It is updated as and when receipts and issues are made in the store department.  5. Transactions are updated individually because at every point of time, store keeper needs to be aware of the actual position of the stock. | 1. Stores ledger is used to record both quantity and the amount of receipts and issues.  2. It is maintained by the costing accounting department of the entity.  3. It is kept outside the store department ort at a place where store keeper has no a access.  4. It is updated when the costing department gets the proper documents from the relevant department normally from store department.  5. It is normally updated after a certain period and one entry is posted for similar items. |

**METHODS OF ISSUING MATERIAL FROM STORE:**

The important methods followed in pricing of issue of materials are:- 1. Actual Cost Method 2. First-In First-Out (FIFO) Method 3. Last-In First-Out (LIFO) Method 4. Highest-in First-Out (HIFO) Method 5. Simple Average Cost Method 6. Weighted Average Cost Method 7. Periodic Average Cost Method 8. Standard Cost Method 9. Replacement Cost Method 10. Next in First Out (NIFO) Method 11. Base Stock Method.

**1. Actual Cost Method:**

Where materials are purchased specially for a specific job, actual cost of materials is charged to that job. Such materials will normally be stored separately and issued only to that particular job.

**2. First-In First-Out (FIFO) Method:**

CIMA defines FIFO as “a method of pricing the issue of material using, the purchase price of the oldest unit in the stock”. Under this method materials are issued out of stock in the order in which they were first received into stock. It is assumed that the first material to come into stores will be the first material to be used.

Advantages:

(a) It is easy to understand and simple to price the issues.

(b) It is a good store keeping practice which ensures that raw material leave the stores in a chronological order based on their age.

(c) It is a straight forward method which involves less clerical cost than other methods of pricing.

(d) This method of inventory valuation is acceptable under standard accounting practice.

(e) It is a consistent and realistic practice in valuation of inventory and finished stock.

(f) The inventory is valued at the most recent market prices and it is near to the valuation based on replacement cost.

Disadvantages:

(a) There is no certainty that materials which have been in stock longest will be used, if they are mixed up with other materials purchased at a later date at different price.

(b) If the price of the materials purchased fluctuates considerably, it involves more clerical work and there is possibility of errors.

(c) In a situation of rising prices, production cost is understated.

(d) In inflationary market, there is a tendency to under-price material issues. In deflationary market, there is a tendency to overprice such issues.

(e) Usually more than one price has to be adopted for a single issue of materials.

(f) The method makes cost comparison difficult of different jobs when they are charged with varying prices for the same materials.

This method is more suitable where the size of the raw materials is large and bulky and its price is high and can be easily identified in the stores separately. This method is useful when the frequency of material receipts is less and the market price of the material are stable and steady.

**3. Last-In First-Out (LIFO) Method:**

Under this method most recent purchase will be the first to be issued. The issues are priced out at the most recent batch received and continue to be charged until a new batch received is arrived into stock. It is a method of pricing the issue of material using the purchase price of the latest unit in the stock.

Advantages:

(a) Stocks issued at more recent price represent the current market value based on the replacement cost.

(b) It is simple to understand and easy to apply.

(c) Product cost will tend to be more realistic since material cost is charged at more recent price.

(d) In times of rising prices, the pricing of issues will be at a more recent current market price.

(e) It minimizes unrealized inventory gains and tends to show the conservative profit figure by valuation of inventory at value before price rise and provides a hedge against inflation.

Disadvantages:

(a) Valuation of inventory under this method is not acceptable in preparation of financial accounts.

(b) It is an assumption of a cash flow pattern and is not intended to represent the true physical flow of materials from the stores.

(c) More than one price may have to be adopted for an issue.

(d) It renders cost comparison between jobs difficult.

(e) It involves more clerical work and sometimes valuation may go wrong.

(f) In times of inflation, valuation of inventory under this method will not represent the current market prices.

4. **Highest-in First-Out (HIFO) Method:**

Under this method, the materials with highest prices are issued first, irrespective of the date upon which they were purchased. The basic assumption is that in fluctuating and inflationary market, the cost of material are quickly absorbed into product cost to hedge against risk of inflation. This method is used when the material is in short supply and in execution of cost plus contracts. This method is not popular and not acceptable under standard accounting practices.

5. **Simple Average Cost Method:**

Under this method all the materials received are merged into existing stock of materials, their identity being lost. The simple average price is calculated without any regard to the quantities involved. The simple average cost is arrived at by adding the different prices paid during the period for the batches purchased by dividing the number of batches. For example, three batches of materials received at Rs. 10, Rs. 12 and Rs. 14 per unit respectively.

The simple average price is calculated as follows:

Rs. 10 + Rs. 12 + Rs. 14/3 batches = Rs. 36/3 batches = Rs 12 per unit

This method is not popular because it takes into consideration the prices of different batches but not the quantities purchased in different batches. This method is used when prices do not fluctuate very much and the stock values are small in value.

**6. Weighted Average Cost Method:**

It is a perpetual weighted average system where the issue price is recalculated every time after each receipt taking into consideration both the total quantities and total cost while calculating weighted average price. For example, three batches of material received in quantities of 1,000 units @ Rs. 15, 1,300 units @ Rs. 16 and 800 units @ Rs. 14.

The weighted average price is calculated as follows:

(1,000 units x Rs. 15) + (1,300 units x Rs. 16) + (800 units x Rs. 14)/1,000 units + 1,300 units + 800 units

= Rs. 15,000 + Rs. 20,800 + Rs. 11,200/3,100 units = Rs. 47,000/3,100 units = Rs. 15.16 per unit

This method tends to smooth out the fluctuations in price and reduces the number of calculations to be made, as each issue is charged at the same price until a fresh batch of material is received.

This method is easier as compared to FIFO and LIFO, as there is no necessity to identify each batch separately. But this method increases the clerical work in calculation of new average price every time a new batch is received. The issue price calculated rarely represents the actual purchase price.

7. **Periodic Average Cost Method:**

Under this method, instead or recalculating the simple or weighted average cost every time there is a receipt, an average for the accounting period as a whole is computed.

The average price for all the materials issued during the period is computed as follows:

**8. Standard Cost Method:**

Under this method, material issues are priced at a predetermined standard issue price. Any variance between the actual purchase price and standard issue price is written off to the Profit and Loss Account. Standard cost is a predetermined cost set by the management prior to the actual material costs being known and the standard issue price is used for all issues to production and for valuation of closing stock.

If initially the standard price is set carefully then it reduces all the clerical work and errors tremendously and the stock recording procedure is simplified. The realistic production cost comparisons can be made easier by eliminating fluctuations in cost due to material price variance. In a situation of fluctuating prices, this method is not suitable.

**9. Replacement Cost Method:**

This method is also called as ‘market price method’. The replacement cost is a cost at which material identical to that can be replaced by purchasing at the date of pricing material issues; as distinct from the actual cost price at the date of purchase. The replacement price is the price of replacing the material at the time of issue of materials or on the date of valuation of closing stock.

This method is not acceptable for standard accounting practice, since it reflects a cost which has not really been paid. If stocks are held at replacement cost, for balance sheet purposes when they have been bought at a lower price, an element of profit which has not yet been realized will be built into the Profit and Loss Account.

This method is advocated by charging the market price of material to the job or process, make it easier to determine the profitability of the job or process. This method is suitable particularly in the inflationary tendency of market prices of materials. Where there is no precise market for particular materials, it would be difficult in ascertainments of replacement prices for the material issues.

**10. Next in First Out (NIFO) Method:**

This method is a variant of replacement cost method. Under this method the price quoted on the latest purchase order or contract is used for all issues until a new order is placed.

**11. Base Stock Method:**

Under this method, a specified quantity of material is always held in stock and is priced at its original cost as buffer or base stock; and any issue of materials above the base stock quantity is priced under any one of the methods discussed above.

This method indicates how prices are moving over a longer period of time. But this method is not popular and also not accepted under standard accounting practice since it would result in stock valuation totally unrealistic.

**UNIT – 3 B MATERIAL CONTROL**

### Meaning:

Material control is the main component of the process of material management.

Control over materials is of utmost importance for smooth and uninterrupted functioning of an organisation.

A few definition of the term are given as under:

“Material control is a systematic control over purchasing, storing and consumption of materials, so as to maintain a regular and timely supply of materials, at the same time, avoiding overstocking.”

“Material control refers to the management function concerned with acquisition, storage, handling and use of materials so as to minimise wastage and losses, derive maximum economy and establish responsibility for various operations through physical checks, record keeping, accounting and other devices. ”

### Objectives of Materials Control:

The following are the main objectives of materials control:

**(a) To enable uninterrupted production:**

The main object of material control is to ensure smooth and unrestricted production. Production stoppages and production delays cause substantial loss to a concern.

**(b) To ensure requisite quality of materials:**

The quality of finished products depends mainly on the quality of raw materials used. If quality of the raw materials is not up to desired standards, the end product will not be of desired quality which affects the sale of the product in the market resulting in loss of profits as well as goodwill of the concern. It is of vital importance to exercise strict control and supervision over the purchases, storage and handling of materials.

**(c) To minimise wastage:**

The loss of material may occur on account of rust, dust, dirt or moisture, bad and careless handling of materials, poor packing and many other reasons. The causes responsible for such losses must be brought to light and utmost efforts should be made to minimise the wastage of raw materials. This is possible only by introducing an efficient materials control system.

**(d) To fix responsibility:**

A proper system of materials control also aims at fixing responsibility of operating units and individuals connected with the purchase, storage and handling of materials.

**(e) To provide information:**

Another objective of materials control is to provide accurate information regarding material cost and inventory whenever needed by management.

**IMPORTANCE OF MATERIAL CONTROL:**

1. For keeping the stock of raw materials within limits in the stores i.e., to avoid overstocking and understocking of raw materials, materials control is significant.

2. It ensures proper storage of materials. For the proper preservation and safety of materials, adequate storage facilities are to be provided. With the help of proper storing of materials, quantity of materials as and when required can be issued to various jobs.

3. For knowing proper cost of production, control over materials is indispensable.

4. Certain techniques and methods are developed under the system of materials control thereby ensuring optimum utilisation of materials.

5. In order to undertake continuous checking of materials, the necessity of a proper system of materials control cannot be ignored.

6. A well managed system of materials control ensures the availability of different kinds of materials without delay.

**SCOPE AND FUNCTIONS OF MATERIAL CONTROL:**

1.**Protects from fluctuations in demand:**

Many a times, the demand forecast of a product is not accurate. There is always a small difference between the demand forecast and actual demand. However, sometimes, there is a big difference between the demand forecast and actual-demand.

So, there are always chances of fluctuations in the demand of a material. These fluctuations can be adjusted if there are sufficient items in the stock of inventory. Therefore, proper inventory control protects the company from fluctuations in demand.

**2. Better services to customers**

If the company maintains a proper inventory of raw-materials, then it can complete its production in time. So, it can deliver the finished goods to the customers in time.

Similarly, if the company has a proper inventory of finished goods, then it can satisfy the additional demand of the customers. So, inventory control helps the company to deliver goods at the right time as demanded by the customers. After making timely delivery, the company can concentrate on giving other services to the customers.

3**. Continuity of production operations**

Proper inventory control helps to maintain continuity of production operations. This is because it maintains a smooth flow of raw materials. So, there are no shortages of raw-materials required for production process.

4. **Reduces the risk of loss**

Proper inventory control helps to reduce the risk of loss due to obsolescence (outdated) or deterioration of items. This is because it checks all the items regularly.

Furthermore, it sells all the slow-moving items, in time, at the market prices. It only maintains the right stock at all times. So, the chances of any item getting outdated is reduced.

5**. Minimizes the administrative workload**

Proper inventory control helps to minimize the administrative work load of purchasing, inspection, warehousing, etc. This will reduce the manpower requirement and will minimize the labour cost too.

**6. Protects fluctuation in output**

Inventory control tries to reduce the gap between planned production and actual production. There are cases where the production schedule cannot be followed because of:

* 1. Sudden breakdown of machines,
  2. Problems in supply of materials,
  3. Sudden labour strikes,
  4. Loss due to failure of power supply, etc.

In such cases, the difference between planned production and actual production can be bridged by inventories held in stock.

7. **Effective use of working capital**

Proper inventory control helps to make effective use of working capital. Inventory control helps in maintaining the right amount of stocks of materials, components, etc. Over stocking is avoided. Therefore, the working capital will not be blocked in excess inventory.

8. **Check on loss of materials**

Inventory control helps to maintain a check on the loss of materials due to carelessness or pilferage (stealing).

If there is no proper inventory control, then there are more chances of carelessness and pilferage by the employees, especially in the store-keeping department.

**9. Facilitates cost accounting activities**

Inventory control facilitates cost accounting activities. This is because, inventory control provides a means of allocating materials cost of products, departments or other operating accounts.

**10. Avoids duplication in ordering**

Inventory control avoids duplication in ordering of stock. This is done by maintaining a separate purchase department. This department will do all the purchasing for the full organisation. No other department is allowed to do purchasing. So there will not be any duplication in ordering of stock.

**Various methods /techniques of material control:**

Some of the most important techniques of material cost control are as follows:

Material control aims at eliminating and minimising all kinds of wastes and losses while the materials are being purchased, stored, handled, issued or consumed. A number of techniques are used at planning, procuring and holding stage of material which help in exercising and effecting material cost control.

**Such techniques have been discussed below:**

### 1. Level Setting:

**In order to have proper control on materials, the following levels are:**

(a) Re-order Level

(b) Minimum Level

(c) Maximum Level

(d) Danger Level

(e) Average Stock Level

**2.EOQ method:** The [economic order quantity](https://www.investopedia.com/terms/e/economicorderquantity.asp) (EOQ) model is used in [inventory management](https://www.investopedia.com/terms/i/inventory-management.asp) by calculating the number of units a company should add to its inventory with each batch order to reduce the total costs of its inventory. The costs of its inventory include holding and setup costs.

The EOQ model seeks to ensure that the right amount of inventory is ordered per batch so a company does not have to make orders too frequently and there is not an excess of inventory sitting on hand. It assumes that there is a trade-off between inventory holding costs and inventory setup costs, and total inventory costs are minimized when both setup costs and holding costs are minimized.

3**.Just –in-time inventory syatem:** The [just-in-time (JIT) inventory system](https://www.investopedia.com/ask/answers/051215/what-are-some-examples-just-time-jit-inventory-processes.asp) is a management strategy that aligns raw-material orders from suppliers directly with production schedules. Companies employ this inventory strategy to increase efficiency and decrease waste by receiving goods only as they need them for the production process, which reduces inventory costs. This method requires producers to forecast demand accurately.

The JIT inventory system contrasts with just-in-case strategies, wherein producers hold sufficient inventories to have enough product to absorb maximum market demand.

4.**ABC analysis**: Inventory optimization in supply chain, *ABC analysis* is an **inventory categorization method** which consists in dividing items into three categories, A, B and C: A being the most valuable items, C being the least valuable ones. This method aims to draw managers’ attention on **the critical few** (A-items) and not on **the trivial many** (C-items).

The ABC approach states that, when reviewing inventory, a company should **rate items from A to C**, basing its ratings on the following rules:

* **A-items** are goods which **annual consumption value** is **the highest**. The top 70-80% of the annual consumption value of the company typically accounts for only 10-20% of total inventory items.
* **C-items** are, on the contrary, items with the **lowest consumption value**. The lower 5% of the annual consumption value typically accounts for 50% of total inventory items.
* **B-items** are the interclass items, with a **medium consumption value**. Those 15-25% of annual consumption value typically accounts for 30% of total inventory items.

**5.VED Analysis:** This is an analysis whose classification is dependent on the user’s experience and perception. This analysis classifies inventory according to the relative importance of certain items to other items, like in spare parts.

In VED Analysis, the items are classified into three categories which are:

* Vital – inventory that consistently needs to be kept in stock.
* Essential – keeping a minimum stock of this inventory is enough.
* Desirable – operations can run with or without this, optional.

**6.Double Bin system**: Two-bin [inventory control](https://www.accountingtools.com/articles/what-is-inventory-control.html) involves the storage of goods in two bins, one of which contains working stock and the other containing reserve stock. The amount of inventory kept in the reserve stock bin equals the amount the company expects to use during the ordering lead time associated with that item. To use this system, reorder goods as soon as the working stock bin is empty, and replacement parts should arrive before the reserve stock bin is empty. It is possible to fine-tune the inventory investment by altering the amount of goods kept in the reserve stock bin. The calculation for the amount of inventory to keep in the reserve stock bin is:

(Daily usage rate × Lead time) + [Safety stock](https://www.accountingtools.com/articles/2017/5/16/safety-stock) = Reserve bin quantity

7**.inventory turnover ratios**: **Inventory turnover** is a ratio that measures the number of times inventory is sold or consumed in a given time period.

Also known as inventory turns, stock turn, and stock turnover, the inventory turnover formula is calculated by dividing the cost of goods sold (COGS) by average inventory.

# ****How to calculate the inventory turnover rate****

There's a simple formula to calculate the inventory formula ratio.

* [Determine the total cost of goods sold (cogs)](https://www.tradegecko.com/blog/inventory-management/how-to-calculate-cogs?hsLang=en-us) from your annual income statement.
* Calculate the cost of average inventory, by adding together the [beginning inventory](https://www.tradegecko.com/blog/inventory-management/how-to-calculate-beginning-inventory?hsLang=en-us) and ending inventory balances for a single month, and divide by two.
* Finally, divide the cost of goods sold (cogs) by average inventory.

8.**input output method:** This is yet another **method of inventory control**. **Input output ratio** is the **ratio** of the quantity of material to **production** and standard material content of the actual **output**.

9.**FNSD method:** FNSD analysis seeks to categorize the inventories into four groups in descending order of their usage. A portion of the inventory items is fast moving ‘F’ which is consumed in a short span of time. Some parts of the inventory items move normally (N) and are used for over a period of a year or so. Some items are slow moving (S) stock of which would last for more than one year. Some materials may be dead stock (D) in the sense that no further demand of such materials is foreseen.

According to this technique, fast moving items of stock need to be constantly monitored and replenishment orders are placed in time to avoid stock-out situations. In case of slow moving items, careful review is required before any order is placed for their replenishment.

10.**material cost reports:** The objective of material cost reporting is to help the management in exercising effective material control and taking appropriate decisions. Material cost reports serve as means of communications usually in the written form of facts relating to materials which should be brought to the attrition of the various levels of management who can use them to take suitable action for the purpose of material control. ‘Material control’ is divided into three aspects, viz. purchase control, stores control and consumption control.

Purchase control is to ensure the efficiency of the purchasing department; stores control, the efficiency of the stores department and consumption control, the efficiency of the departmental foremen.

11.**perpetual and physical inventory verification method:** In **perpetual inventory**, the **system** continually estimates the ending **inventory**. The **perpetual system** is a records estimating **system** only, and not a **physical** check of the **inventory**. Systems that use **perpetual** record keeping usually do a **periodic physical inventory** to **verify** their records.

**LIMITATIONS OF MATERIAL CONTROL:**

(i) Efficient inventory control methods can reduce but cannot eliminate business risk.

(ii) The objectives of better sales through improved service to customer; reduction in inventories to reduce size of investment and reducing cost of production by smoother production operations are conflicting with each other.

(iii) The control of inventories is complex because of the many functions it performs. It should be viewed as shared responsibilities.

**UNIT- 4 MATERIAL HANDLING**

#### ****Meaning of Material Handling:****

Material handling may be considered a specialized activity for modern manufacturing units. From the time, the input material or raw materials enter the industrial unit and go out of the unit in the form of finished products, these are handled at all stages in between, no matter, on the shop floor or in the stores.

Definition: “Material handling” refers to the movement of materials from the store room to the machine and from one machine to the next machine or work station during the process of manufacture.

While designing new plants, materials handling is a prime consideration and several existing plants can be modified by the utilization of modem material handling devices. The cost of production is decreased by the use of these devices since these devices increase output, improve the quality and speed up the deliveries.

**Objectives of material handling:**

## Cost Reduction

One of the main objectives of material handling is the reduction of production cost. Material handling can constitute as much as 50 percent of total product cost and effective handling of materials can help minimize this cost. When handling costs are reduced the overall unit cost is reduced as a direct result. Sophisticated management theories, including just-in-time production and supply chain management are primarily concerned with materials handling.

## Increasing Warehouse Capacity

When materials are not stored correctly in a warehouse, much of the facility is being wasted. This wastage adds to the cost of the product. Focusing on efficient storage in terms of cubic as well as floor space becomes important. Minimizing aisle space is also necessary with respect to increasing the amount of storage space. In both cases effective use of material handling will help to reduce warehousing cost of materials.

## Improving Layout to Reduce Waste

A complete analysis of the flow of materials between operations, volumes, flow paths and timing is a must for efficient material handling. When space requirements are optimized and travel times reduced through the use of efficient handling systems and equipment, material handling becomes more cost effective. Further, this will lead to enhanced productivity.

## Optimal Equipment Utilization

Expensive equipment often fails to operate at full potential simply because the material handling system does not permit it to. For example, the rate at which materials are supplied or removed could cause a drop in equipment performance by simply leaving it standing idle. With a proper material handling system in place or more efficient control of an existing system, equipment utilization can soon be maximized.

## Increasing Safety

Safety in any organization is a primary concern and an efficient material handling system can make a direct contribution to the safety of workers, materials and associated equipment. With an efficient system in place, accident costs, lost time and damage to materials, among other things, can be reduced.

#### Improved Customer Service:

Customer’s service will be improved by following proper and improved materials handling system which will enable regular and timely market supply by avoiding disruption in production schedule. These are the main sources of good customer service.

**IMPORTANCE OF MATERIAL HANDLING:**

For many large companies, their warehouse is the hub of their operations. The success of their business depends on the safe and efficient transport of their product from one area of the warehouse to another. Here are 5 reasons why strict materials handling guidelines are crucial to avoiding unnecessary costs.

**1. Avoiding Workplace Accidents/Workplace Compensation Costs**

About 21% of permanent disabilities and over 25% of temporary disabilities can be attributed to workplace accidents due to the mishandling of materials. The key to avoiding this is having the correct equipment and machinery along with the well-trained staff. This will greatly reduce employee injuries and lost sick days.

**2. Efficiency Saves Your Money**

A well-organized warehouse with the most efficient materials handling tools will translate into fewer misplaced items. Employees will waste less time searching for products. This will save you money.

**3. Reduces Product Loss**

No company wants to incur product damage and loss in their warehouse which will decrease your profit margin. Implementing good materials handling practices in your warehouse will go a long way to preventing product damage and loss.

**4. The Importance of Warehouse Layout**

Smart storage solutions will create a safe environment for your employees. An open plan of your warehouse will facilitate easy materials handling while minimizing hazardous conditions.

**5.Customer Service Matters**

As a consumer, I typically choose a company based on the quality of their customer service. The faster employees can find the products in your warehouse, the faster you can deliver them to your customers. Correct materials handling contributes to streamlining the coordination of your warehouse operations. Better customer service gives your company the edge over your competition.

## Principles of Material Handling

* **Planning Principle**

The planning principle states that all material handling operations should be the results of a deliberate plan. The performance objectives, the need of the operation and the functional specification should be defined from the very beginning.

* **Light weight Principle**

**It means the weight of material should not be heavy or it would be less heavy. So that it will be move from one place to another.**

* **Work Principle**

The work principle of material handling believes that material handling work should be minimised without hindering productivity or the service level requires for the operation.

* **Ergonomic Principle**

The capability of humans and limitations should be recognised and respected. This should be considered when designing the material handling tasks and equipment in order to ensure a safe and effective operation.

* **Unit Load Principle**

This principle of material handling requires all unit loads to be appropriately sized. They should also be configured to achieve the material for and the objectives at each stage in the supply chain.

* **Space Utilisation Principle**

Space Utilisation requires all available space is used effectively and efficiently.

* **System Principle**

The system principle states that all material movement and storage activities should be integrated to form a coordinated operational system. This should include the following things.

* Receiving
* Inspection
* Storage
* Production
* Assembly
* Packaging
* Unitising
* Order Selection
* Shipping
* Transportation
* Handling of returns
* **Automation Principle**

Wherever possible, all material handling operations should be mechanised or automated. This improves operational efficiency, increased responsiveness, improved consistency, predictability and decreases operational costs and/or potentially unsafe manual labor.

* **Environmental Principle**

The environmental principle of material handling believes that all environmental impact and energy consumption should be considered when designing or selecting alternative equipment and material handling systems.

* **Life Cycle Cost Principle**

Finally, a thorough economic analysis should account for the entire lifecycle of all material handling equipment and resulting systems.

**Write a note on: modern trends of material handling**

. This is a summary of what material handlers need to be formatting to now and in the future.

1. **Changing Workforce:** “Of all the conversation topics from all the workshops, the issue of the changing workforce sparked the most passionate response.” This should not surprise anyone who is currently in the industry. The workforce is getting older, and it is increasingly difficult to find quality candidates to hire. Bond summarizes, “Going forward, the roadmap suggests industry, academia and government join in a renewed effort to increase workforce demographics including women, workers under 35, people with disabilities and veterans.”
2. **E-Commerce**: The usage and availability of today’s technology is forcing an online and omni-channel presence from retailers. As we head further into the future, this will only strengthen. Therefore, “By 2025, the report suggests, all shipments should be trackable in real time from the instant an order is placed to the instant of delivery, both in transit and in facilities, at the level of individual items and independent of carrier or transportation mode. In addition, typical order-to-ship processing times in e-commerce distribution should be sufficient to support same-day delivery of in-stock items.”
3. **Unconventional Competition:** While price and service will continue to define competition, the way in which competitors work together to keep up with cost may look a lot different. “…By 2025, a significant portion of shippers should be sharing transportation assets as a standard business practice.” Companies will find they can save on costs by sharing truck space. This will take a lot of trust, but the experts agreed these would be terms that could eventually be agreed upon.
4. **Mass Personalization**: As is being accomplished in several industries, material handlers will need to accommodate personalized item requests at mass-produced prices. So far this is made possible by flexible manufacturing and automation among other things. “…The Holy Grail of retailing is the ability to deliver custom products at mass-production prices. What’s more, customers will increasingly expect those products to reach them when and where they want.”
5. **Urbanization:** Half the population resides in urban areas, and this trend will continue moving forward. Retailers will have to meet consumer demands by transporting smaller quantities of a wider range of products to more distant and remote locations. “To tackle that challenge by 2025, the 15 largest U.S. cities should have at least one open shared self-service parcel delivery kiosk network available for use by multiple retailers…”
6. **Mobile and Wearable Computing:** Consumers are growing more accustomed to using mobile devices and wearables like Google Glass to share, acquire, and send information. “The roadmap suggests that by 2025, control and execution systems featuring wearable computing devices should be developed and widely adopted in transportation, warehousing and manufacturing.”
7. **Robotics and Automation**: Right now automation is a luxury and an innovation in the way that order picking, real-time tracking, and other applications are carried out. It seems to be the only way to keep up with the growing demands of the consumer in a fast-paced, cost-efficient manner. This will become more mainstream moving forward. “By 2025, the roadmap points to affordable robotic order picking systems being available that support high-throughput, single-piece picking in both part-to-picker and picker-to-part configurations. And, economical, high-speed automation to load and unload trucks should be available, both at the carton and pallet level.”
8. **Sensors and Communication:** Working in conjunction with automation will be sensors and their communication capabilities. An entire digital system may handle everything from tracking, maintenance, and decision-making where product orders and shipments are concerned. “The roadmap offers that by 2025, major intermodal hubs throughout the United States should have the ability to handle standardized containers at the unit-load and carton level, plus load/unload integration with freight containers. And, it further suggests that universally accepted data formats for all types of sensors should be established.”

**Different types of material handing equipments:**

**Material handling equipment** is any tool used to aid in the movement, protection, storage, and control of materials and products. The equipment used to do so can be broken down into four main categories. Each category has a wide variety of useful equipment that makes safely moving heavy materials or large volumes of materials easier.

**Storage and Handling Equipment**

The title of this equipment category is pretty self-explanatory. Storage equipment is used to hold materials while they wait to be transported from the manufacturer or wholesaler to their final destination. Having the right storage equipment can increase efficiency on the production floor and maximize space utilization- two very important factors in any production environment.

**Examples of storage and handling equipment include:**

• **Racks**: such as pallet racks, drive-through or drive-in racks, push-back racks, and sliding racks  
• **Stacking frames**: these are interlocking units that enable stacking of a load so crushing doesn’t occur  
• **Shelves**  
• **Bins and drawers**

• **Mezzanines**: elevated floor systems that are installed between the production floor and ceiling in order to provide additional storage space. Most of these structures can be dismantled and moved with ease.

**Engineered Systems**

This type of material handling equipment are typically automated units that work together to enable efficient storage and transportation of large materials or large volumes of materials around the production floor. Examples of engineered systems include:

• **AS/RS**: Automated Storage and Retrieval Systems (abbreviated as AS/RS) are large automated structures that involves racks, aisles and shelves that are accessible by a type of mechanized shuttle system (like a cherry picker) for the quick retrieval of items.  
• **Conveyor systems**: Automated conveyor systems carry heavy materials to specified destinations using belts, flexible chain, or live rollers. It is a highly efficient equipment to move large volumes of material quickly.  
• **Robotic delivery systems**– These automated systems are ideal for moving products on an assembly line or transporting goods throughout a plant or warehouse.  
• **Automatic guided vehicles**– These vehicles are mobile robots that follow specific markers or wires in the floor to move large materials around a manufacturing facility or warehouse. Vision, magnets, or lasers can also be used as methods for AGV navigation.

**Industrial Trucks**

Powered industrial trucks, such as forklifts, are used to move large materials or large quantities of materials around the manufacturing floor. They are also utilized to efficiently load (or unload) heavy objects onto delivery trucks. Industrial trucks are very useful when there is insufficient flow volume to justify the implementation of a conveyor system. Examples of industrial trucks include:

• **Hand trucks**– Also known as a dolly, or box cart. Hand trucks are l-shaped box-moving handcarts with handles at one end, wheels at the base, and a ledge to set objects on.  
• **Pallet jacks**– These are tools are the most basic form of a forklift and used to lift and move pallets within a warehouse.  
• **Pallet trucks**– Manual operated or powered industrial forklifts.  
• **Walkie stackers**– A pedestrian walk-behind stacker with a mast for lifting pallets to heights.  
• **Platform trucks**– These are similar to a two wheeled dolly, but with an extended deck.  
• [**Order picker**](https://www.kokeinc.com/products/order-picker-platforms/)– An electric lift truck specifically designed for filling individual customer orders. This requires piece-part picking rather than selecting full pallets or unit loads.  
• **Sideloader**– Automated tool similar to a fork lift that loads and unloads from the side of the machine rather than the front.  
• **Automatic guided vehicles**

**Bulk Material Handling Equipment**

Equipment that deals with bulk handling aids in the control and transportation of large volumes of material either in bulk or loose form. In general the equipment is used to move loose parts from one area of the production floor to another. Drums and hoppers can also be used to funnel loose items so they can be easily manipulated or packaged. Bulk Material Handling Systems can also utilize conveyor belts for horizontal transportation and elevators for vertical transportation. Examples of bulk material handling equipment are:

• **Conveyor belts**

**• Stackers**– Similar to forklifts, stackers help to lift and stack heavy loads on the dock or in the warehouse.  
• **Reclaimers**– These are large machines used to recover bulk materials from a stockpile.  
• **Bucket elevators**– Also known as a grain leg. These elevators haul flowable bulk materials vertically.  
• **Grain elevators**– This type of equipment is used to store and move grain and other similar materials throughout a production pathway.  
• [**Hoppers**](https://www.kokeinc.com/products/self-dumping-hoppers/)– Hoppers are a container for bulk material such as grain, that tapers and discharges it’s materials at the bottom.  
• **Silos**– A tower used to store grain and other materials such as coal, sawdust, woodchips, and food products.

## Factors Affecting the Selection of Material Handling equipment

The following factors are to be taken into account while selecting material handling equipment.

**PROPERTIES OF THE MATERIAL**

1. Whether it is solid, liquid or gas, and in what size, shape and weight it is to be moved, are important considerations and can already lead to a preliminary elimination from the range of available equipment under review. Similarly, if a material is fragile, corrosive or toxic this will imply that certain handling methods and containers will be preferable to others.
2. **LAYOUT AND CHARACTERISTICS OF THE BUILDING**

Another restricting factor is the availability of space for handling. Low-level ceiling may preclude the use of hoists or cranes, and the presence of supporting columns in awkward places can limit the size of the material-handling equipment. If the building is multi-storied, chutes or ramps for industrial trucks may be used. Layout itself will indicate the type of production operation (continuous, intermittent, fixed position or group) and can indicate some items of equipment that will be more suitable than others. Floor capacity also helps in selecting the best material handling equipment.

1. **PRODUCTION FLOW**

If the flow is fairly constant between two fixed positions that are not likely to change, fixed equipment such as conveyors or chutes can be successfully used. If, on the other hand, the flow is not constant and the direction changes occasionally from one point to another because several products are being produced simultaneously, moving equipment such as trucks would be preferable.

1. **COST CONSIDERATIONS**

This is one of the most important considerations. The above factors can help to narrow the range of suitable equipment, while costing can help in taking a final decision. Several cost elements need to be taken into consideration when comparisons are made between various items of equipment that are all capable of handling the same load. Initial investment and operating and maintenance costs are the major cost to be considered. By calculating and comparing the total cost for each of the items of equipment under consideration, a more rational decision can be reached on the most appropriate choice.

1. **NATURE OF OPERATIONS**

Selection of equipment also depends on nature of operations like whether handling is temporary or permanent, whether the flow is continuous or intermittent and material flow pattern-vertical or horizontal.

1. **ENGINEERING FACTORS**

Selection of equipment also depends on engineering factors like door and ceiling dimensions, floor space, floor conditions and structural strength.

1. **EQUIPMENT RELIABILITY**

Reliability of the equipment and supplier reputation and the after sale service also plays an important role in selecting material handling equipments.